INTELLIGENCE MEMORANDUM

THE ROLE OF TRANSPORT IN THE ECONOMY OF COMMUNIST CHINA 1950-55

CIA/RR IM-419

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FOREWORD

The progress of Communist China's attempts to industrialize the economy rapidly is to a great extent dependent on the capabilities of its transport system, which affects many of the basic production sectors of the economy. Concerted efforts have been made to modernize transport services inherited by the Communists in 1949. This memorandum is an attempt to determine the progress of these efforts and to assess the performance and adequacy of the Chinese transport system as a whole and by its individual components. The memorandum also devotes considerable attention to Chinese efforts to expand transport capability to meet increasing economic requirements, and in doing so it emphasizes the growing importance of the railroads in the basic reorientation of China's economy.

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S-E-C-R-E-T

THE ROLE OF TRANSPORT IN THE ECONOMY OF COMMUNIST CHINA*
1950-55

Summary

The transport sector of the economy of Communist China appears to be responding to the demands of the increasing requirements of expanding economic activity. The transport system of China was not used to capacity by the Chinese Nationalists, but the Communists have pushed its capacity to the limit. In order to expand the system further, notably in the railroad and highway sectors, there has been intensive exploitation of personnel and equipment. As a result, significant rates of growth in each sector of transport have been attained.

This is particularly true of the overburdened railroads, the only medium of transport whose progress will significantly affect Communist China's attempts to increase its economic potential through accelerated industrialization. Conscious that increased railroad capability is essential to plans for increased industrialization, the Chinese are exerting considerable effort to strengthen the railroad system. Although this effort requires extensive allocations of resources which in large measure must be generated by the Chinese economy, it would be dangerous to assume that railroad shortcomings will be permitted to impair industrial growth. The power of the regime to allocate labor and capital resources on a priority basis points to the contrary. Moreover, considering the close working relationship between Peiping and Moscow, it seems unlikely that the USSR would fail to provide for any Chinese deficiencies in resources required for railroad expansion.

Future developments in the field of transport, especially in the railroad sector, should provide excellent criteria for judging the strength and adequacy of the Chinese Communist economy.

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* The estimates and conclusions contained in this memorandum represent the best judgment of ORR as of 8 November 1955.

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I. Transport Facilities.

A. Internal.

Internal transport routes in Communist China are concentrated in the eastern half of the country, converging primarily on such large, populous economic centers as Mukden (Shen-yang), Peiping, Shanghai, Hankow (Hang-k'ow), and Canton (Kuang-chou). The industrial region in the northeast, in particular, is well served by internal transport routes. Construction of new transport routes into western areas served largely by primitive means of transport is being increasingly emphasized, however, in an attempt to develop unexploited resources and to increase the effectiveness of central government control.

Since 1953 the Chinese Communists have attempted to increase the freight-carrying capacity of their transport system. Heavier loading of freight cars and increased efficiency in their use have accompanied a steady growth in the car park. Nevertheless, present traffic levels are taxing freight car utilization to the limit, and a considerable expansion seems mandatory if projected traffic levels are to be attained. Despite an extensive waterway fleet, whose over-all capacity has not been fully utilized since 1950, the Chinese Communists are adding new vessels annually. An effort is being made to replace less efficient junks, the traditional mainstay of river operations, by more modern craft, many of which are powered by diesel engines. To meet increased traffic requirements, the highway vehicle park also has grown steadily since 1950, chiefly because of large imports from the Soviet Bloc. When domestic manufacture of motor vehicles commences in 1957, increasing the rate of growth of the truck park, there will be less dependence on such imports. The lack of modern civil air transport services in Communist China is emphasized by its limited aircraft inventory, which consists of Soviet planes and some US planes acquired from the Chinese Nationalists by abandonment or defection.

1. Rail.

Since the end of 1949, when they had only 21,700 kilometers of operable railroad track, the Chinese Communists have allocated a large part of available resources to the expansion of the system and to strengthening existing facilities and have made considerable progress.* By the end of 1954, 24,690 kilometers of track

* See the map showing the railroads of Communist China, inside back cover.

were operable, and 1,000 kilometers of new lines are to be constructed in 1955. New track construction has been emphasized in the western provinces and in strategic supply lines provided to the southeastern coast, but the rail system remains most dense in the northeast and east-central parts of the country, where economic development is greatest. Continued efforts to reach undeveloped areas and to increase the logistic capability of the railroads should increase significantly the total operable track by 1960. 1/*

An analysis of the relationship between traffic and operational data indicates that the Chinese required about 68,000 freight cars in 1954, an increase of about 22 percent over the estimated number for 1952. A recent announcement indicates that rolling stock production as well as inventory may be even higher than these requirements suggest. 2/ The annual rate of expansion, however, does not seem to have been adequate, as is suggested by the progressive decline in that portion of the park believed to be held in reserve during 1952-54. It is probable, therefore, that shortages of rolling stock restrict current operational capacity to some extent. The limited inventory probably would be a crucial factor in the event of an emergency, especially because many units have passed the normal retirement age.

2. Inland Water.

The inland waterway system of Communist China is one of the most extensive in the world. Some 95,000 kilometers of inland waterway routes are now open to navigation, although most are suitable only for shallow draft vessels. 3/ With the exception of the Hsi River system in the provinces of Kwantung (Kwang-tung), Kwangsi (Kuang-si), and Hunan (Hu-nan), the river system is concentrated largely north of the Yangtze (Ch'an Chiang) River and east of Chungking (Ch'ung-ch'ing). The Yangtze River, traditionally the main artery of waterborne commerce, has retained its relative significance despite considerable reductions in traffic. Of seven rivers in the northeast, only the Sungari (Sung-hua Chiang), an artery for domestic traffic and Sino-Soviet trade, is of any importance. Though few of the significant waterways lie south of the Yangtze, in some sections of this region rivers provide the principal means of transport. Despite recent construction efforts, the traditional waterway routes in China have not been significantly augmented and probably will not be in the near future. Extensive plans for river improvement, however, probably will make many of the neglected routes more useful as supplementary routes to overburdened rail lines.

* For serially numbered source references, see Appendix B.

Similarly, little change in the river fleet has occurred since the Chinese Communists came to power. Although there is insufficient intelligence on the Chinese Communist waterway inventory, there is general agreement on two important facts: (a) the self-propelled fleet remains small, both actually and relatively, and (b) the non-self-propelled fleet consists mainly of many small junks, which have an impressive aggregate cargo capacity. The junk fleet, estimated at approximately 370,000 units of 10 metric tons* capacity each, is concentrated largely on the Yangtze and its tributaries, which cover the area of greatest demand for its services. The self-propelled fleet, probably similarly concentrated, is estimated to total only about 750 steamers, tugs, and passenger launches. 4/ The growing dependence of these vessels on petroleum fuels 5/ emphasizes a trend that has continued despite measures taken by the West to reduce the availability of petroleum to China. Moreover, the construction of new vessels and plans for fleet expansion emphasize diesel engines, with few references to steam propulsion.

3. Highway.

The Chinese Communists have made considerable progress in the construction of new highways. The road network was expanded from 78,000 kilometers in 1950 to 140,000 kilometers by the end of 1954, mainly by extending new highways into areas served formerly by coolie and animal transport. 6/ At present, the greater part of this road net is not capable of supporting truck traffic throughout the year. It is fairly well dispersed, however, except in Inner Mongolia, and is densest in northeast and central-south China. 7/ Construction of new roads into border areas and into mining and industrial regions is expected to bring the total length of highway in China to 158,000 kilometers by 1960. Low standards of construction, however, will continue to keep the efficiency of Chinese highway transport at a low level. Transport in the mountainous areas is especially poor during the rainy season, when earth-surfaced roads deteriorate rapidly. Limited bridge capacities, many ferry crossings, and vulnerability to flooding in some areas create further limitations to the efficiency of the Chinese road system. Dependence on inferior materials and lack of mechanical equipment will continue to impede the modernization of Chinese highways for many years.

* Unless otherwise indicated, tonnages are given in metric tons throughout this memorandum.

In their efforts to increase the vehicle park, the Chinese Communists have had considerable success. It is estimated that, mainly because of large imports of vehicles from the Soviet Bloc, the motor truck inventory grew from 40,000 units in 1950 to some 67,000 units in 1954. 8/ Continued imports from the Bloc and the domestic manufacture of vehicles, beginning in 1957, are expected to bring the total truck park to 150,000 units by the end of 1960. 9/

4. Air.

During 1954 the unduplicated basic civil air network of Communist China comprised approximately 15,700 route-kilometers flown by two airlines -- the Chinese People's Aviation Corporation (CPAC) and the Sino-Soviet enterprise, the Soviet-Chinese Joint Stock Company for Aviation (SKOGA). 10/ With the withdrawal of the USSR from SKOGA at the end of 1954, the Chinese Communists undertook to operate the entire network. Main flights are scheduled over the eastern part of the country and radiate principally from Peiping to centers such as Mukden, Shanghai, and K'un-ming. Connections are made with the Soviet civil air net across Mongolia to Irkutsk and across Sinkiang to Alma-Ata. While the civil air network amounts to only one-fifth of the system extant in 1948, it seems likely to expand in the near future. Prospects exist for extending Chinese air routes to North Vietnam, Burma, India, and possibly Indonesia. Discussions with Burma and India to establish reciprocal air services with China are already under way.

The inventory of the Chinese Communist civil air fleet, composed of various types of craft acquired from diverse sources, is also well below pre-Communist levels. By the withdrawal of the USSR from joint ownership in SKOGA, the Chinese obtained the 18 Li-2 (CAB) aircraft provided by the USSR as its share in the company. These were added to the existing CPAC fleet, the nucleus of which had been acquired in 1949 by defections from the Chinese Nationalist airlines based at Hong Kong. These, in addition to the Nationalist aircraft abandoned on the mainland, had given CPAC a fleet of 13 C-47's, 12 C-46's, and 1 Convair 240, all of US manufacture. 11/ With the subsequent acquisition of additional Li-2's and normal rates of attrition, the Chinese civil air fleet probably consisted of about 50 2-engine transports in mid-1955, a considerable reduction over the 92 aircraft, including some 4-engine types, available in 1948. Some additions from the USSR can be expected in the near future, however, as the entire Bloc continues to regularize its air operations.

B. Coastal Shipping.

Operations of the Chinese Communist ocean fleet, which was considerably reduced by the removal of many vessels to Formosa by the Chinese Nationalists, are confined to serving domestic coastal trade. The limited size of the fleet compels the Chinese Communists to rely on foreign-flag tonnage, both Soviet Bloc and non-Bloc, for some domestic trade, and for all longer international movements. Between 1950 and 1954 the Chinese merchant fleet increased only moderately. During this period it grew from 79 vessels of 175,000 gross register tons (GRT) to 111 vessels of 278,000 GRT. 12/ Increasing emphasis is being given to the coastal fleet, however, to lessen the Chinese Communists' dependence on foreign-flag shipping. By mid-1955 the coastal fleet had grown to 120 vessels of 295,000 GRT and, according to recent statements by Li Fu-shun, probably will be augmented considerably by the end of 1957. 13/ The Chinese Communists are believed capable of building a fleet of 350,000 to 400,000 GRT by 1960, but this would still be less than half the size of the merchant tonnage possessed by the Chinese Nationalists in 1949. Despite impressive plans and recent accomplishments, therefore, Communist China lacks a merchant marine fleet adequate for a world power, and it will be some years before it can appreciably improve its ranking of 25th among the merchant fleets of the world.

The domestic operations of the Chinese Communist merchant fleet are augmented by a large number of ocean-going junks, which may amount to about 10,000 vessels with a total carrying capacity of 400,000 to 500,000 tons, 14/ and by foreign-flag shipping. Junks operate mainly south of the Yangtze estuary, and the large Chinese Communist vessels engaged in coastal trade are concentrated in the area north of Shanghai and to a lesser extent in the area from Swatow south, because of Nationalist patrols in the East China-Formosa Strait area. Soviet vessels occasionally engage in domestic shipping from Shanghai north, and a small group of non-Communist ships ply the waters to the south, despite accompanying hazards, and provide a shuttle-type service out of Hong Kong.

Few of the hundreds of ports and landings along the Chinese coast are of major importance to foreign or domestic traffic. Dairen (Ta-lien), Ta-ku, Tientsin (T'ien-ching), Hsinkang, Tsingtao (Ch'ing Tao), Shanghai, Swatow (Shen-t'ou), and Canton/Whampoa (Huang-pu), which can discharge a total of 115,000 tons daily, comprise 66 percent of the

total cargo-handling capacity of Chinese ports. The minor ports of Chinwangtao (Ch'in-huang-tao), Ningpo (Yin-hsien), Wenchow (Yung-chia), Chefoo (Yen-t'ai), Amoy (Hsia-men), Chan-chiang (Fort Bayard), Haihou, Yulin, and Foochow (Fu-chou) are important terminals for domestic coastal trade. 15/ Amoy and Foochow, opposite Formosa, are currently of singular importance as possible staging areas for an offshore island offensive against the Chinese Nationalists.

II. Progress in Restoring and Developing the Transport Sector of the Economy.

A. Factors Affecting the Rate of Growth.

The growing performance of China's transport system since the Communist gained control of the government has been the product of many factors -- a growing demand for the service, increased investments, and improved operating efficiency. Chief among these have been the increased requirements of the industrialization program. Considerable investment to rehabilitate facilities and equipment was necessary to obtain optimum use of the established system. Subsequent and planned expenditures are directed toward expanding transport capacity to prevent the system from becoming a bottleneck. The need for maximum utilization of existing facilities has resulted in intensive efforts to increase the efficiency of traffic operations, a goal of particular significance in railroad transport, where the limited equipment available is being taxed to the utmost.

1. Demand: Pattern of the Use of Facilities.

Production data for basic sectors of the Chinese Communist economy provide a relatively valid indication of transportation performance. This is especially true of Chinese railroads, whose growth has consistently paralleled increases in production of basic commodities. Table 1* shows production in basic sectors of the Chinese economy during 1953 and 1954 and indicates the growing requirements for transportation:

* Table 1 follows on p. 8.

Table 1

Production of Basic Sectors of the Economy
of Communist China 16/
1953-54

Million Metric Tons

Commodity	1953	1954
Coal	70.4	80.0
Construction materials	538.5	770.5
Food crops	154.9	159.0
Timber	14.6	17.7
POL (including imports)	1.4	1.6
Ferrous metals	9.9	12.8

a. Internal.

(1) Rail.

Railroads have borne the major burden of the expanding Chinese Communist economy, especially in areas of industrial production and consumption. Manchuria, which comprises 9 percent of China's area, has more than half the total rail mileage, and originates more traffic per capita than does all the remainder of China. Manchuria produces half the coal, most of the soya beans, much of the wheat and timber, more than half of the ores and steel, and a high percentage of manufactured products that move in commerce. The Peiping-Tientsin area, and the regions around Tsingtao, Shanghai, Hankow, and Canton are also important, but the larger part of China originates little rail traffic. The southeast coast, most of the middle Yangtze valley, Szechwan (Ssu-ch'uan), and the southwest, Kansu, Tibet, and Sinkiang are still restricted to local trade between villages and nearby farms and contribute little to rail transport. The results of efforts to develop these areas have been small. 17/

As is evident, Chinese rail operations consist largely of the movement of a few bulk commodities from a few places of origin to a few principal destinations. Coal, the largest single item shipped,

comprises about one-third of total tonnage. Foodstuffs are also a major traffic commodity, followed by mineral construction material, wood, and ores. Iron and steel products such as plates, shapes, and rails are becoming of increasing importance, while petroleum products are still relatively minor items. 18/

(2) Inland Water.

Inland water transport in Communist China carries bulk cargoes where speed is not important. It is essentially a local operation -- the average length of haul was only 370 kilometers in 1954 -- despite the great length of main routes such as the Yangtze River. Traditionally, Chinese waterways have carried much of the country's traffic in agriculture and building materials, and to a lesser extent, industrial equipment and consumer goods. The increased emphasis on rail transport, which has replaced water carriage as the principal mover of freight, and the extensive loss of foreign coastal shipping have reduced the relative importance of water transport and have been accompanied by shifts in the composition of waterway traffic. Agricultural cargoes, although still of major significance, are becoming relatively less important as industrial traffic increases. Between 1951 and 1953 the proportion of agricultural cargoes on the Yangtze River, which comprise about half of waterway freight movement, decreased from 40 to 30 percent of total traffic. 19/

The trend toward increased use of waterways to convey industrial cargoes may continue, in view of large construction requirements in areas accessible to river vessels and increased attempts to reduce the railroads' burden by shifting traffic to rivers wherever possible. In most cases, however, there is little choice between rail and water routes, because they do not parallel each other to any significant extent. Because the traffic demands of Chinese industry impose a north-south axis on freight movement, the east-west orientation of Chinese rivers probably will limit their potential importance.

(3) Highway.

Motor transport in Communist China is chiefly employed for short-distance intercity freight movement. In the north and central sections of the country, where the road network is fairly dense, although in poor condition, it acts mainly as a feeder to railroads and rivers, whereas in Manchuria the main roads paralleled rail

lines and are therefore complementary. In some areas, notably the mountainous southeast, southwest, and west, roads provide the only means of communication. 20/

Motor transport has encouraged the growth of commercial centers in rural areas not served directly by rail or waterway. New feeder roads which join many scattered farming communities to the transport network have facilitated the marketing of commodities previously dependent on animal and coolie carriers. The extension of new roads into remote border regions has assisted the economic and cultural development of racial minority districts and tied them more closely to the central government.

(4) Air.

Air transport in Communist China plays a very limited role in current freight movement, but it is important in the movement of high-value, low-tonnage cargo and for high-priority personnel transportation. The lack of modern aircraft probably will hamper the modernization of civil air transport for some time, although the prospective introduction of Soviet Il-14 (CRATE) planes on a small scale will improve operations to some extent.

b. Coastal Shipping.

Interdiction of coastal shipping activity by the Chinese Nationalists is effective to a limited extent and only in the Formosa Strait area. In the Yellow Sea and the Pohai Gulf, the Chinese Communists have developed trunk and feeder passenger and freight routes to service all coastal ports north of Wenchow. Coal and foodstuffs in transit between Shanghai and ports in North China probably constitute the bulk of traffic. In the South the Chinese have established routes radiating from Canton and serving the Kwangtung coast and Hainan.

The limited capacity of the Chinese Communist merchant fleet tonnage has compelled their reliance on foreign-flag vessels for some domestic coastal movements. The performance of this small but active group of vessels cannot be determined accurately. Western-flag ships are used primarily to augment Chinese Communist junk operations south of Shanghai, where Nationalist patrols prevent the use of larger Chinese vessels. A few Soviet vessels are active intermittently in coal traffic north of Shanghai.

2. Investment.

The value of Chinese Communist investment in transportation cannot be determined, but, judging by the extent of the rehabilitation and expansion programs, it has been considerable. The announced Five Year Plan (1953-57) investment in transportation and communications construction is 8.21 billion yuan, or about 20 percent of the total investment of new capital. 21/ The transport system inherited by the Communists, weakened by years of war, had to be rehabilitated, and, in the case of the railroads, greatly expanded, to implement Chinese Communist plans to industrialize the economy rapidly. Considerable effort has been directed toward restoring and expanding highway transport and, to a lesser extent, water, but the danger of hostilities along the China coast and the reorientation of China's foreign trade, as well as its economy, has compelled major emphasis to be on strengthening railroads. Although considerable progress in railroad development has been made since 1949, and railroad performance has increased in accordance with economic requirements, the strain of supporting a growing economy was apparent in 1954, in increased shortages of freight cars and locomotives and a reduced rate of growth. It seems likely, therefore, that a program of additional capital investment, designed to increase route capacity and the availability of equipment, is necessary to improve railroad performance. Chinese investment plans recognize these shortcomings and show an intention to prevent them from becoming a brake on industrialization.

a. Internal.

(1) Rail.

A large part of the investment resources available to Communist China since 1949 have been allocated to the expansion of the rail system and to improving its existing facilities. During the First Five Year Plan, 5.671 billion yuan, or about 70 percent of total investment of new capital in transport and communications, are to be allocated for rail transport. Of this, 2.365 million yuan are earmarked for new rail construction. 22/ By the end of 1954, 3,000 kilometers of new operable track were constructed and 1,000 kilometers of new line are to be laid in 1955. A major part of the new construction is concentrated in the western provinces of China. The extension of the rail system into less accessible regions is designed mainly to exploit undeveloped economic resources and to provide more effective political

20 percent of total railroad investment planned for 1955 is to be devoted to the manufacture of rolling stock and motive power. This large allocation indicates that a progressively tightening freight-car and locomotive shortage exists and that the Chinese Communists intend to prevent it from slowing down economic growth.

(2) Inland Water.

The Communist regime has developed an impressive program for the rehabilitation and improvement of its inland waterways which will benefit other sections of the economy as well as transport. It is estimated that the First Five Year Plan includes an allocation of 800 million yuan for capital investment in water transport, but the allocation to inland waterway construction cannot be separated. 28/ Appropriations for waterway construction in 1954 however, were 74 percent higher than in the previous year and reportedly will increase by 35 percent in 1955. 29/ In contrast to the years immediately after 1950, when the reconstruction of ports and harbors received primary attention, the main emphasis now seems to be placed on the improvement of long-neglected facilities and routes. Water conservation and flood control projects are major targets which will be of most benefit to agriculture but to some extent will overcome also seasonal restrictions on navigation in some areas.

Relatively little investment was devoted to additions to inventory before 1954, as most of the investment was for the purchase of second-hand craft or for salvage work. Since 1954, however, more emphasis has been placed on new construction. Following the launching in September 1954 of the Min-chang, the first passenger steamer built under the Communist regime, the construction of numerous small launches, tugs, and freighters has been reported.

The Yangtze River is receiving particular attention. Appropriations for construction projects in 1953 were 4 times the amount for 1952, 30/ and planned investment during 1955 was scheduled to increase 70 percent over the 1954 level. 31/ Major efforts are being directed toward channel improvement, as evidenced by the opening in January 1955 of night navigation in the upper Yangtze, between I'chang and Chungking.

The central government, in an effort to reduce its financial burden, has decreed that local authorities must finance inland water transport improvements. This directive, issued in November 1953

by Chou En-lai, 32/ does not seem to have brought the desired results, however, for local officials are still relying on the central administration for required funds.

(3) Highway.

The Chinese Communists have placed considerable emphasis on road rehabilitation and on new construction, which is accomplished primarily by manual labor because only limited mechanical equipment is available. Since 1950 highways have doubled in length. The first Plan allocates an estimate of 900 million yuan for highway construction, or about 10 percent of the total investment of new capital in transport and communications. Major emphasis has been placed on the extension of the highway network to border regions where only primitive means of communication formerly existed. The Sikang-Tibet, Tsinghai-Tibet, and Kunming - Ta-lo roads are examples of this trend. The road to Ta-lo on the Burmese border may prove particularly significant if, as is believed possible, it facilitates Chinese economic penetration of Burma. The thorough reconditioning and expansion of the Fukien network, means of logistic support for an offensive in the Formosa area, also has strategic as well as economic significance. 33/

Continued efforts to modernize Chinese highway transport seem probable. The 1955 plan provides for the survey and construction of 23 new roads, mainly in industrial and mining areas or leading into national minority regions. 34/ Construction is to be completed on the Lhasa-Gyangtze-Shigatse road in the Tibet Autonomous Region and its branch leading south through Phari Dzong into India. Work will also continue on the Sikang-Tibet and Tsinghai-Tibet roads, which require constant maintenance to be fully usable. These and other projects will add 4,500 kilometers to the highway network of Communist China during 1955. 35/ An indication of the investment in inventory can be obtained from the plan to produce 4,000 vehicles in 1957. 36/

(4) Air.

During the First Five Year Plan, 101 million yuan are to be invested in civil aviation. The end use of this allocation cannot be determined, but some investment is being made in addition to inventory of equipment. Equipment received from the USSR following

its withdrawal from SKOGA is being paid for on a long-term basis. The requirement for new aircraft which will accompany route expansion will doubtless be met from the same source and on similar terms.

b. Coastal Shipping.

Investment in the Chinese Communist merchant marine service, probably limited by the prospect of hostilities in the Formosa Strait, has apparently been devoted in large part to modernizing the existing fleet and improving the port facilities. Terminals of importance to foreign trade have received special attention, as indicated by construction of a new deep-water port at T'ang-ku in North China. In 1954, moreover, the government allocated nearly 10 million yuan to increase port mechanization, 37/ in an attempt to replace primitive cargo-handling procedures. Efforts to reduce the dependence of Communist China on foreign-flag shipping for overseas and domestic trade probably will involve added expenditure for new ship purchase and construction, particularly if the Formosa issue is peacefully settled and regular coastal services can be reestablished.

3. Operating Efficiency.

Attempts to improve transport efficiency are evidenced with great frequency in Chinese Communist plans. Claims of success exist in similar profusion, but in many cases there is no reliable basis for judging their validity or their relationship to pre-Communist operations. In some instances the extensive efforts to make optimum use of facilities and equipment are indicative of the strain under which transport facilities are operating. This seems particularly true of the railroad system, whose capacity the Chinese Communists are most interested in increasing. In inland waterways and coastal shipping, claims of great percentage increases in utilization must be tempered by the facts that the capability of equipment inherited by the Communists exceeded traffic demands and that operations were often extremely inefficient. Increased utilization, therefore, is not necessarily indicative of increased operating efficiency, although some progress has been made in this direction.

a. Internal.

(1) Rail.

In their quest for increased traffic capacity, the Chinese Communists have emphasized maximum utilization of available rolling stock. Particular emphasis has been placed on decreasing turnaround time and increasing loads per car, which individually affect operating efficiency and, combined, determine maximum freight-car requirements at given traffic levels. Success is apparent in both these areas. Between 1950 and 1953, turnaround time was reduced from 4.7 to 4.0 days, where it has apparently leveled off. By 1954 the average load per car had reached 31.6 tons, an increase of 3.3 tons over the average of 1950. The significance of this achievement is apparent when it is realized that the increase in the average carload of coal by 1.3 tons in 1954 over 1953 was equivalent to loading an average of 6,500 additional tons in 24 hours. 38/

Reductions in turnaround time are not likely to continue. New lines extended into remote areas will tend to offset gains elsewhere, especially if economic activity is thereby stimulated to any great extent. Load per car, on the other hand, should continue to increase, chiefly because the introduction of freight cars of larger capacity will tend to raise the average load.

(2) Inland Water.

Chinese Communist statements claim sharp rises in the operating efficiency of the river fleet. In addition to increased efficiency in performance, there is reported consolidation and reorganization in management to permit closer control of operations. Voyage time has been reduced in some instances by as much as one-half. The efficiency of tugs has been improved by the substitution of the pushing method for the traditional towing of barges, with a resultant increase in speed and decrease in fuel consumption. 39/

Labor productivity also is improving, although shortages of trained personnel persist. Efforts are being made to reduce administrative duplication and to organize traffic operations more efficiently. Remarkable improvement is claimed in some areas in cargo-handling efficiency. 40/ Primarily, this has been the result of increased substitution of mechanical equipment for manual operations rather than of training which, despite much publicized help from the USSR, remains quite limited. 41/

In addition to increasing the efficiency of water carriers, the Chinese Communists have directed some effort to making the cost of river transport more attractive to shippers. Substantial reductions in freight rates during the first 3 years of Communist control apparently indicate an intention to reestablish the prewar competitive status of inland water transport. 42/ Continued efforts to increase operating efficiency in the coming years seem likely. Moreover, considerable inefficiency in the operations of the diverse water transport system inherited by the Communists not only makes past accomplishments appear impressive but assures a certain degree of success in the future.

(3) Highway.

The efficient utilization of highway transport in Communist China is hampered to a large extent by physical restrictions, such as low-capacity bridges, numerous ferries, and inadequate road construction and maintenance. Lack of adequately trained personnel has also been a problem. Although the technological innovations necessary to overcome physical limitations have not been forthcoming to an appreciable degree, 43/ considerable effort has been directed toward reducing inefficient hauling. Provincial transport companies were established under central control of Peiping, and a rigid system of traffic control was introduced to allocate trucking properly. 44/ Administrative reorganization, coupled with the introduction of heavier loading vehicles, undoubtedly resulted in some improvement, but commodity distribution is such that trucks are still required to operate empty more than half the time.

The need for more technically trained personnel was realized by the Chinese Communists as early as 1952, 45/ but the building of adequate training facilities is still, for the most part, in the planning phase. Technical advice provided in many cases by the USSR, however, overcomes this deficiency to some extent.

(4) Air.

Operating efficiency of civil air transport in Communist China is believed to have suffered by the conflict in ideologies between the US-trained managerial group that defected from the Nationalists and the Peiping organization, which has been strongly

influenced by the USSR. Political reliability apparently has been placed before technical training as a requirement of responsibility, a Communist tendency that in many cases compounds inefficiency. 46/

b. Coastal Shipping.

Comparative analysis of growth indexes for the merchant marine inventory of Communist China and its performance shows that great strides have been made in increasing the utilization of the coastal fleet. Much of the progress was undoubtedly due to the growing demand for shipping services, with which the fleet was more than adequate to cope. 47/ Some slack in fleet operations may in fact still exist. Nevertheless, the Chinese continue to emphasize efficiency as a primary goal and claim some successes in the attainment. Efforts have been directed toward a more efficient use of labor by the mechanization of cargo handling at ocean terminals and closer supervision of traffic operations. 48/ The constant fulfillment of performance plans, in some cases by substantial margins, indicates progress in this direction, since targets are apparently integrated with plans for increasing efficiency.

III. Adequacy of the Transport System.

Since the Communists gained control of mainland China in 1949, transport service as a factor of demand has shown marked increases in performance, paralleling to a great extent the growth of the industrial sector of the economy. By 1954, total traffic in terms of tons originated was more than double 1950 performance. (See Table 2*.) In some cases the magnitude of annual increases has been due to the depressed levels of production of the economy in 1949 and the accompanying underutilization of transport capacity. In any event, gains in transport performance have been impressive, particularly in the railroad sector, which by 1953 had equaled in tons originated the previous peak year of 1945 under the Japanese. Inland water traffic, although increasing at a rate greater than railroad tons originated, by 1954 had reached a level of only somewhat less than half previous peak performance. By 1960 this deficiency is expected to be overcome, but with the growing dependence on railroads, river transport is likely never to regain its relative position among China's freight carriers.

* Table 2 follows on p. 19.

Table 2

Transport Performance of Communist China a/
1950-60

	Billion Ton-Kilometers					Million Metric Tons-Originated				
Year	Rail b/	Inland Water	Ocean Shipping b/	Highway c/	Total	Rail d/	Inland Water d/	Ocean Shipping e/	Highway	Total
1950	39.7 f/	1.9 53/	0.3 54/	0.22 55/	42.12	99.2 56/	3.9 57/	0.6 58/	6.8 59/	110.5
1951	51.5 g/	2.3	2.3	0.32	56.42	110.5	6.2	2.5	8.2 61/	127.1
1952	59.5 h/	3.7	3.7	0.68 63/	67.58	131.0 64/	9.6	4.0	20.7 65/	165.3
1953	76.6 66/	5.7 67/	4.0 68/	1.09	87.39	157.0 69/	15.0 70/	4.6	30.0 71/	206.6
1954	91.5	7.4 i/	4.4	1.50	104.80	183.0 72/	20.0 73/	5.5	42.9 j/	251.4
1955	102.0	9.0	4.7	2.00	117.70	207.9	25.0	6.3	51.5 j/	290.7
1956	111.0	10.5	5.2	2.60	128.30	225.0 75/	30.0	7.2	59.6 j/	321.8
1957	121.0	11.7	5.7	3.20	141.60	245.0	34.5	8.1	67.5 j/	355.1
1958	135.0	13.5	6.0	3.90	158.40	260.0	39.7	8.6	73.5 j/	381.8
1959	145.0	14.4	6.3	4.52	170.22	275.0	43.7	9.0	80.0 j/	407.7
1960	160.0	15.9	6.6	5.30	187.80	300.0	48.1	9.4	86.0 j/	443.5

a. Excluding air transport performance, which is negligible by comparison.
b. 1957 is based on data in source 49/. Other years are based on interpolation and projection.
c. 1952 and 1957 are based on the Fifth Five Year Plan. Other figures are based on interpolation and projection.
d. 1955 through 1960 is based on interpolation and projection of data from source 50/.
e. 1953 through 1960 is based on interpolation and projection of data from source 51/.
f. Based on tons originated multiplied by data on average length of haul given in source 52/.
g. Based on tons originated multiplied by data on average length of haul given in source 60/.
h. Based on tons originated multiplied by data on average length of haul given in source 62/.
i. Based on tons originated multiplied by tons originated 1954-60 multiplied by an estimated average length of haul.
j. Projection based on data in source 74/.

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Highway transport remains of little significance in terms of total transport performance. It is, however, significant in the long-haul movement of goods in the western provinces, as is indicated by the growing volume of traffic carried annually. Civil air transport has not yet attained previous levels of performance. The probable addition of new air routes to adjacent countries of Southeast Asia and prospective acquisition of better performing Soviet aircraft, however, are expected to facilitate progress in the future. Despite the disruption of regular coastal services which followed the Communist acquisition of control over China, Chinese merchant marine performance has grown considerably, although as yet the fleet remains well below pre-Communist levels. The basic reorientation of China's foreign trade toward the Soviet Bloc, accompanied by an increased use of railroads for such traffic and the disruption of regular services in the Formosa Strait, is likely to impede the growth of Chinese coastal shipping.

A. Internal.

1. Rail.

Since the Communists gained control over mainland China in 1949, the railroads have evidenced progressive gains in performance, consistent with the requirements of a growing economy. By 1953, freight traffic more than tripled the performance in 1949, when traffic was at a low of 48.2 million tons originated because of economic and political disorganization following the civil war. As of 1954, when tons originated reached 183.0 million, however, there were indications that the railroads were operating under an increasing strain, which might soon become acute for both the economic and military sectors of China. 76/

Although the magnitude of annual increases in terms of tonnage increments has been growing, the proportionate growth during recent years has become smaller. Tons originated have fallen from a 20-percent increase in 1953 over 1952 to a planned 13.6-percent increase in 1955 over 1954. Coupled with increasing evidence of equipment shortages, this suggests that the Chinese Communists apparently have reached a definite turning point in the development of railroad transport. Palliative measures to increase capacity through a series of administrative reforms and workers emulation campaigns are believed to have reached their effective limits. Further

appreciable progress by the railroads can be accomplished only through a program of additional capital investment, designed to increase both physical route capacity and the availability of rolling stock and motive power. 77/

Plans indicate a cognizance of these requirements. Whether or not the Chinese Communists have the resources available to implement the extensive investment program evisioned, however, remains to be seen. Moreover, the effect of the reported cut of $270 million in planned expenditures for railroad expansion 78/ cannot be determined, but it seems not to have affected the extensive construction program now under way. Notwithstanding possible shortcomings, however, it is probable that, should the USSR so desire, all current problems facing the Chinese railroads could be overcome through the import of necessary material and equipment from the Soviet Bloc.

2. Inland Water.

In 1954 the performance of inland water transport in Communist China in terms of ton-kilometers was almost four times greater than in 1950, whereas tons originated during these years grew at a somewhat greater rate because of a progressively decreasing average length of haul. Despite such steady improvement since the Communists assumed control of China, however, river traffic has not yet approached prewar levels. Continued emphasis on this medium of transport, and the consequent gains envisioned, should bring performance close to prewar levels by 1960, when it is estimated that some 48 million tons of cargo will be originated. Nevertheless, with the increasingly important role of the railroads, it is considered that inland water transport will never again be as important to China in terms of percentage of total traffic as it was in the 1930's.

3. Highway.

In 1954 the performance of highway transport in Communist China was almost seven times greater than in 1950. The extent of progress in road transport is indicated by the fact that its share of total tons originated by all carriers in China has grown from about 6 percent in 1950 to over 16 percent in 1954. Performance probably would have been much greater and the apparent burden on vehicles much less but for a traffic pattern that permits the use of freight space for only half the average haul. Nevertheless, excess ton-kilometer

capacity exists, and constant efforts to increase truck utilization, coupled with the growing demand for motor transport services in established economic areas as well as in newly developed regions, is expected to bring performance by 1960 to a level three times that of 1954.

4. Air.

Civil air transport in China has never regained its former position, nor has it approached its peak performance attained in 1948. By 1954, only one-fifth of the length of the 1948 network was being flown and the number of aircraft available had been reduced from 92, including 4-engine types, to between 35 and 40, all 2-engine planes. Nevertheless, some progress from the low level of performance of 1949 is apparent in the increase in traffic between 1950 and 1954. Moreover, performance through 1960, which will be influenced by the relinquishment of Soviet stockholdings in SKOGA, is expected to increase steadily. The regularization of civil air operations throughout the Sino-Soviet Bloc is expected to lead to the Chinese acquisition of new Soviet aircraft, probably the better performing Il-14 (CRATE) which the Poles and Czechoslovaks have obtained to fly routes shared with Aeroflot, the Soviet air carrier. 79/

B. Coastal Shipping.

Despite the irregularities and disruptions in the coastal trade of Communist China, traffic carried in Chinese vessels during 1954 represented an eightfold increase over 1950. The growth of merchant shipping since 1949, however, has been hampered by several factors connected with the Communist rise to power. The extensive loss of merchant shipping tonnage to the Nationalists and the radical shift in international trade routes from sea to rail through Manchuria, which accompanied the reorientation of China's foreign trade toward the Soviet Bloc, were particularly responsible for reducing the demand for shipping. Both river and coastal traffic suffered. The results probably are most noticeable in the sizable reduction in cargo handled at Shanghai, formerly China's most important river and coastal port.

Additions to the coastal fleet, coupled with continuing efforts to increase its utilization, are expected to raise performance by 1960 to about 50 percent above the 1954 level. Planned traffic levels differ considerably with estimated prospective performance, but they are apparently based on unrealistic expectations of fleet increases, and, in any case, they are not supported by past rates of growth.

APPENDIX A

GAPS IN INTELLIGENCE

A. Rail.

In spite of the fact that significant progress has been made during the past 2 years toward filling gaps in intelligence on Chinese Communist railroad activity, many of the estimates contained in this memorandum are not based on series of data. This often allows for varied interpretations of information at hand. More specifically, this dearth of information is particularly crucial as concerns railroad traffic in terms of tons originated, the rolling stock inventory, and the construction of new lines.

1. Railroad Traffic.

Very little information is available concerning the commodity composition of Chinese Communist freight traffic. Because of significant changes in the pattern of traffic movements in China under the Communist regime and because of a lack of a complete series of pre-1949 reports, the general statements which have been made by the Communists during the 1950-55 period add little which would permit an accurate appraisal of commodity movements, particularly of traffic in coal, agricultural products, and sand and gravel. In the case of coal, more information is needed concerning major producing mines whose production is consumed locally. Information concerning traffic in agricultural products and in sand and gravel is wholly inadequate to permit anything more than a general appreciation of the magnitude of such traffic.

Chinese Communist figures of railroad traffic continue to pose a problem of interpretation. Tenuous as information from Communist sources sometimes appears, it is often more significant than was probably intended, especially when it can be related to pre-1949 data and to reports of on-the-spot observers.

2. Freight Car Park.

Current estimates of the Chinese Communist freight car park are founded primarily on the number of cars which would be required to move announced traffic levels. Although these estimates are believed to be reasonable, they do not contain the degree of certitude needed for this vital statistic. A more solid position in reference to tons per car and turnaround time would significantly improve the intelligence community's knowledge of both the operation and the capacity of the Chinese Communist rolling stock inventory. In addition, current data concerning retirement rates, reserve factors, repair rates, rolling stock production, and equipment imports suffer from the apparent Communist effort to withhold information concerning these important factors.

3. New Line Construction.

In the field of construction activity, the Chinese Communists have, on the whole, been able to withhold information concerning the construction of new lines. Lacking current information concerning the construction of new lines, the intelligence community's interpretation of Chinese Communist capabilities, vulnerabilities, and intentions, through study of rail transport must remain somewhat tentative.

B. Water.

Major gaps exist in the following fields:

1. Inventory.

Available intelligence affords little detail on the number, type, tonnage, and other aspects of the inland water fleet. Intelligence as to geographic distribution of the inland fleet is also poor. Ocean fleet data are considerably better; the main gap is in intelligence on the fleet under 1,000 GRT. Little is available on inventory or distribution of that large group of vessels.

2. Traffic.

Except for very general data and fragmentary data on various regions (insufficient to enable construction of over-all traffic figures), intelligence on traffic performance is poor. There

is little appreciable difference in the poor quality of inland and ocean traffic. Inland traffic data are, however, somewhat better.

3. Ports.

Intelligence on ocean ports served by Western-flag vessels is adequate to good, and other port intelligence is poor to nonexistent. Little or nothing is available on such major ports as Hankow, Chungking, or Harbin to allow up-to-date appraisal of capacities and operations.

4. Administration.

Much is lacking on administrative and operational aspects of water transport. Although there is some useful intelligence on organization, it is generally out of date. On the other hand, there is virtually nothing on the administrative functioning of the water transport system or on its interrelationship with other agencies.

5. Budget.

Lack of budget data is serious. Without such data the position which water transport occupies in state planning cannot be determined. Budget information is usually in the broadest possible terms or is combined with other nonrelated items. For example, transport and water conservancy are often combined, or water transport and postal budgets are combined.

6. Rate and Cost.

Virtually no intelligence is available on rates or costs in water transport. This gap creates a serious barrier to the appraisal both of the utility of water transport and of its competitive position in the transport economy.

C. Highway.

Several important gaps exist in intelligence on highway transport in Communist China. Sufficient data on the vehicle inventory are not available. Estimates are limited in value, since they can only be given in terms of total numbers of trucks, buses, automobiles, and the like, and cannot be made validly by type, organization, and carrying capacity. Intelligence on the operation of the truck park is also

very limited. Essential operational factors such as time spent in operation, time in repair, and average length of haul are given occasionally. They are restricted generally, however, to certain areas of operation and often conflict with one another.

The most useful statistic for computing traffic estimates is the percentage distribution of traffic moving in state-operated vehicles as opposed to that moving in private vehicles. Information of this type is not presently available. Traffic statistics are often given for state-operated Class 1 carriers, but these data are incomplete and do not permit an accurate evaluation of total traffic. A regional knowledge of the transport services performed by state vehicles as opposed to those performed by private vehicles is also essential to a thorough analysis of the traffic pattern. Such information is presently not available. Information on the extent of use of military vehicles in support of civilian traffic is also needed. Certain assumptions can be made from available data, but they are often misleading when applied to the country as a whole.

Intelligence on motor transport repair facilities is very sparse as regards their actual number, distribution, and adequacy. Such information is of major importance in estimating the use and availability of motor vehicles. Moreover, the lack of data regarding investments in motor transport and road construction is another major gap in intelligence. Actual investment figures are rarely announced, so that any analysis of the general level of expenditures must be given necessarily in terms of new construction data and known increments to the vehicle park.

From the present level of intelligence received on the above subjects, it seems unlikely that any of these gaps can be filled in the near future.

D. Air.

Rather serious gaps remain in information on civil aviation in Communist China. Satisfactory data on the personnel complement of the airline are not available. The deficiency is particularly serious in regard to the distribution of airline personnel: that is, the number of pilots and other airline personnel and the number of qualified employees available for maintenance, communications,

and administrative functions. In addition, little is known about the training of airline personnel. Available information gives no firm indication of the total number trained since 1950, of the number trained in each category, or of the standards and general effectiveness of the training program.

Information is not available in sufficient detail concerning the organization of the Civil Aviation Bureau in Peiping.

Another major deficiency is the lack of statistical information concerning the cargo shipped by air and concerning the part played by Chinese Communist air transport in East-West trade.

APPENDIX B

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

Source of Information	Information
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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